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# A COMPARATIVE STUDY TO ASSESS THE LEVEL OF PAIN AMONG CRITICALLY ILL VENTILATED PATIENT DURING THE ENDOTRACHEAL TUBE SUCTIONING AND ORAL SUCTIONING PROCEDURE.

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**ABSTRACT:**

**Background of the study:** Many patients in intensive care unit are artificial ventilated, and managing that care is a fundamental element of clinical nursing practice. Pain evaluation and management in these patients need to be a priority with regularly monitoring, assessment, reassessment, and clear documentation done to facilitate treatment and communication among healthcare worker. **Aim:** this study aimed to assess the level of pain during suctioning procedure. **Material and method:** Study was conducted in a tertiary care hospital after obtaining ethical permission. Non-experimental descriptive research designs with non probability –purposive sampling technique among critically ill intubated patient of critical care unit. Sample were randomly allotted in endotracheal tube group (n=10) and oral group (n=10), demographic and biological parameter were collected, behavioral pain assessment scale used to assess the level of pain among critical ill intubated patient. Inferential and descriptive statistics used with SPSS (version 20) software. **Result:** Majority of endotracheal group (60%) and oral group (50%) had having moderate and mild pain during suctioning compare to oral group, endotracheal group

 

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have more pain during suctioning. The age, gender, medical diagnosis, heart rate, respiratory rate, blood pressure, oxygen saturation, Glasgow coma scale are the associated variable in pain during suctioning at 0.05 level of significant. **Discussion and conclusion:** mechanically ventilated patient are unable to express their fallings oral, patient who are critically ill intubated experienced pain during routine procedure. Behavioral pain assessment scale is very useful for assessment of pain of non-communicable patient.

***Key word: Behavioral pain scale, Ventilated patient.***

**Introduction:**

Health is considered as one of the important components in life. Health, as well as great duration of life, should be protected and enhanced as much as possible. It is a state of perfect harmony between all the organs and systems of the body, in any situation. Early detection and treatment is one of the measures to prevent illness and hazardous complications. Early diagnosis is the key to better management.[1-2]

Documenting of patients' pain history, its treatment, and its reassessment actions is needed to improve practice and research.[3] Pain assessment and management documentation in critical care settings has been addressed in many studies. However, few studies have addressed documentation of pain assessment and management in critical care, especially in patients unable to verbally communicate[4] a large number of instruments can be used for pain assessment of unconscious and mechanically ventilated patients. It is based on behaviors, observation, physiological parameters, and other body signs that can indicate. From that, this review aimed to describe pain measurement techniques for mechanically ventilated adult patients based on evidences and perspectives already published about this subject.[5]

Some of the researcher conducted study on pain assessment of mechanically ventilated patient during the routine and invasive procedure in intensive care unit. They found that mechanically ventilated patient may have pain. Assessment of pain done by Biological parameters and the standardized tool: Behavioral Pain Scale. Study shows that the Behavioral pain scales are reliable and valid for use in a clinical setting; clinicians need to consider this variable and intervene to decreased pain among mechanically ventilated patient. The Behavioral pain scale is one of the

 

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tool that have been developed and validated for the assessment of non-communicable patient, who are critically ill.[6, 7, 8]

**Methodology:**

The research design used in the study was non-experimental descriptive research design. The sampling technique used for this study was non probability purposive sampling. The sample comprised of twenty ( ten each in two group i.e. endotracheal and oral suctioning respectively) critically ill intubated patients, admitted in ICU in Dhiraj Hospital, Vadodara, Gujarat. The tool consists of section A: Biological parameter tool. Section B behavioral pain scale. The data analysis was planned on the basis of objective of the study using descriptive and inferential statistics in consideration with hypothesis of the research study. The data collection tool includes two section, the first one consist of biological parameter such as Age, Gender, diagnosis, Heart rate, Respiratory rate, Blood pressure, Oxygen saturation, Glasgow coma scale. The second consist of behavioral pain scale.

**Results**

The aim of analysis and interpretation was to organize and give meaning to the data. The data were organized according to the objectives of the study. The purpose of the analysis was to summaries, compare and tests the proposed relationship and interpret findings. The data analysed by using descriptive and inferential statistics.

**TABLE 1: Frequency and percentages distribution of biological variables among critical ill ventilated patient receiving endotracheal tube and oral suctioning**

**n=20**

| SR. NO | BIOLOGICAL PARAMETTER | Endotracheal tube suctioning (n=10) | | Oral suctioning (n=10) | |
|---|---|---|---|---|---|
| | | Frequency | percentage | Frequency | percentage |
| 1. | | | | | |
| | a) 21-30 years | 4 | 40% | 5 | 50% |
| | b) 31-40 years | 3 | 30% | 2 | 20% |
| | c) 41-50 years | 2 | 20% | 2 | 20% |
| | d) >50 years | 1 | 10% | 1 | 10% |
| 2. | **GENDER** | | | | |
| | a) Male | 7 | 70% | 6 | 60% |

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| | | | | | |
|---|---|---|---|---|---|
| | b) Female | 3 | 30% | 4 | 40% |
| 3. | **MEDICAL /SURGICAL DIAGNOSIS** | | | | |
| | a) Pneumonia | 4 | 40% | 5 | 50% |
| | b) COPD | 2 | 20% | 1 | 10% |
| | c) ARDS | 2 | 20% | 2 | 20% |
| | d) Tuberculosis | 2 | 20% | 2 | 20% |
| 4. | **HEART RATE** | | | | |
| | a) 61-70 beats/per minutes | 2 | 20% | 0 | 0% |
| | b) 71-80 beats/per minutes | 3 | 30% | 0 | 0% |
| | c) 81-90 beats/per minutes | 4 | 40% | 3 | 30% |
| | d) Above 90 beats/per minutes | 1 | 10% | 7 | 70% |
| **5.** | **RESPIRATORY RATE** | | | | |
| | a) 11-14 breaths/per minutes | 0 | 0% | 1 | 10% |
| | b) 15-18 breaths/per minutes | 3 | 30% | 2 | 20% |
| | c) 19-22 breaths/per minutes | 3 | 30% | 5 | 50% |
| | d) 23-26 breaths/per minutes | 4 | 40% | 2 | 20% |
| **6.** | **BLOOD PRESSURE** | | | | |
| | a) Normal {less than 120/80 mm of hg} | 1 | 10% | 2 | 20% |
| | b) Elevated [130/80 mmofhg] | 3 | 30% | 5 | 50% |
| | c) stage 1[140/90mmof hg} | 5 | 50% | 2 | 20% |
| | d) stage 2[more than 150mmofhg] | 1 | 10% | 1 | 10% |
| **7.** | **OXYGEN SATURATION** | | | | |
| | a) 81-85% | 4 | 40% | 2 | 20% |
| | b) 86-90% | 3 | 30% | 2 | 20% |
| | c) 91-95% | 3 | 30% | 3 | 30% |
| | d) 96-100% | 0 | 0% | 3 | 30% |
| **8.** | **GCS** | | | | |
| | a) Mild (13-15) | 1 | 10% | 6 | 60% |
| | b) Moderate (9-12) | 2 | 20% | 4 | 40% |
| | c) Severe (3-8) | 7 | 70% | 0 | 0% |

Majority of the critically ill ventilated patients receiving endotracheal suctioning were 4 (40%) age between 21-30 year, were 7 (70%) gender are male, were 4 (40%) having diagnosed pneumonia, were 4 (40%) have heart rate between 81-90 beats per/minutes, 4 (40%) were respiratory rate between 23-26 beats per/minutes, were 5 (50%) blood pressure between stage

 

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one (140/90 mmof hg).4 (40%) were oxygen saturation between 81-85%,and 7 (70%) were GCS severe (3-8).

Majority of the critically ill ventilated patients receiving oral suctioning were 5 (50%) age between 21-30 year, were 6 (60%) gender are male, were 5(50%) have diagnosed pneumonia, were 7(70%) have heart rate between above 90 breaths per/minutes, 5 (50%) were respiratory rate between 19-22 beats per/minutes, were 5 (50%) blood pressure elevated (130/80 mmof hg), 3 (30%) were oxygen saturation between 81-85% and 96-100% ,and 6(60%) were GCS mild (13-15).

**TABLE 2: Frequency and Percentage distribution of pain level during endotracheal tube suctioning and oral suctioning of ventilated critically ill patients**

| Sr. No. | Risk category | Endotracheal tube suctioning (n=10) | Percentage (%) | Oral suctioning (n=10) | Percentage (%) |
|---|---|---|---|---|---|
| 1 | No pain | 0 | 0% | 2 | 20% |
| 1 | Mild | 2 | 20% | 5 | 50% |
| 2 | Moderate | 6 | 60% | 3 | 30% |
| 3 | Severe | 2 | 20% | 0 | 0% |
| TOTAL | | 10 | 100% | 10 | 100% |

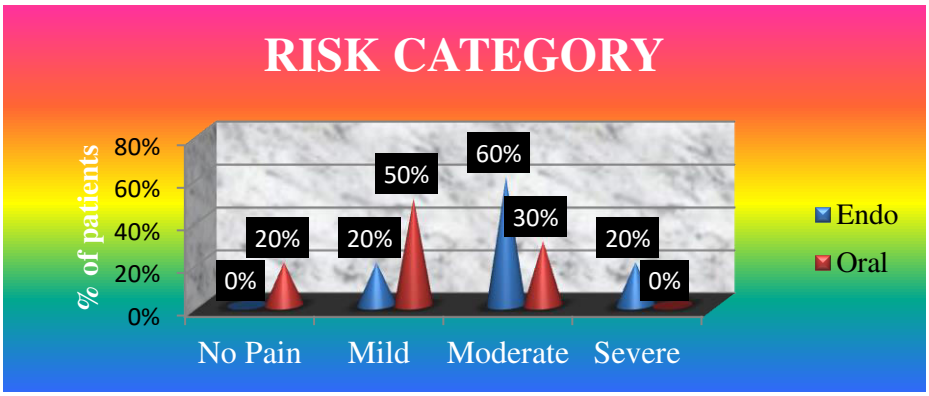


**Figure 1: Cone column diagram showsPercentage distribution of pain level during endotracheal tube suctioning and oral suctioning of ventilated critically ill patients**

Majority of patient having 6(60%) moderate pain during endotracheal suctioning and 2(20%) respondents had severe pain and 2(20%) had mild pain during endotracheal suctioning. Whereas,

 

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in oral suctioning; majority 5(50%) of patient had mild pain and 3(30%) had a moderate pain and 2(20%) had no pain during oral suctioning and no one having severe pain during oral suctioning.

**TABLE 3: Comparison of mean level of pain among critically ill ventilated patient during the endotracheal tube suctioning and oral suctioning**

| Group | Pain level score | Mean difference | t-test |
|---|---|---|---|
| Endotracheal (n=10) | 3.00 ± 0.66 | 0.9 | t=2.862 |
| Oral (n=10) | 2.10 ± 0.73 | | $p$= 0.01** |

**highly significant at $p \leq 0.001$

In the endotracheal and oral group mean was 3.00 and 2.10 and SD was 0.66 and 0.73. The t-test value was 2.862 greater than the table value which was at the p=0.01 level of significance. Hence the hypothesis $H_1$was accepted.

**TABLE 4: Association between pain score of ventilated critically ill ventilated patients with their selected biological parameter of endotracheal tube suctioning n=20**

| Biological Parameter | Pain score | | | | N | Chi square | Df | Level of significance |
|---|---|---|---|---|---|---|---|---|
| | No Pain | | Moderate Pain | | | | | |
| | N | % | N | % | | | | |
| **Age** | | | | | | | | |
| a) 21-30 years | 4 | 40% | 0 | 0% | 4 | χ2=10.00 | df=3 | p=.019 Significant |
| b) 31-40 years | 3 | 30% | 0 | 0% | 3 | | | |
| c) 41-50 years | 0 | 0% | 2 | 20% | 2 | | | |
| d) Above 50 years | 1 | 10% | 0 | 0% | 1 | | | |
| **Gender** | | | | | | | | |
| a) Male | 7 | 70% | 0 | 0% | 7 | χ2=5.833 | df=1 | p=.016 Significant |
| b) Female | 1 | 10% | 2 | 20% | 3 | | | |
| **Diagnosis** | | | | | | | | |
| a) Pneumonia | 4 | 40% | 0 | 0% | 4 | χ2=3.750 | df=3 | p=.290 NS |
| b) COPD | 1 | 10% | 1 | 10% | 2 | | | |
| c) ARDS | 2 | 20% | 0 | 0% | 2 | | | |
| d) Tuberculosis | 1 | 10% | 1 | 10% | 2 | | | |
| **Heart rate** | | | | | | | | |
| a) 61-70 b/min | 1 | 10% | 1 | 10% | 2 | | | |

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| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| b) 71-80 b/min | 2 | 20% | 1 | 10% | 3 | $\chi2$=2.708 | df=3 | p=.439 NS |
| c) 81-90 b/min | 4 | 40% | 0 | 0% | 4 | | | |
| d) >90 b/min | 1 | 10% | 0 | 0% | 1 | | | |
| **Respiratory rate** | | | | | | | | |
| a) 11-14 breath/ per minute | 0 | 0% | 0 | 0% | 0 | $\chi2$=5.833 | df=2 | p=.054 Significant |
| b) 15-18 breath/ Per minute | 3 | 30% | 0 | 0% | 3 | | | |
| c) 19-22 breath/ Per minute | 1 | 10% | 2 | 20% | 3 | | | |
| d) 23-26 breath/ Per minute | 4 | 40% | 0 | 0% | 4 | | | |
| **Blood pressure** | | | | | | | | |
| a) Normal (less than 120/80 mm of hg) | 1 | 10% | 0 | 0% | 1 | $\chi2$=.833 | df=3 | p=.841 NS |
| b) Elevated (130/80 mm of hg) | 2 | 20% | 1 | 10% | 3 | | | |
| c) Stage 1 (140/90 mm of hg0 | 4 | 40% | 1 | 10% | 5 | | | |
| d) Stage 2 (more than 150 mm of hg | 1 | 10% | 0 | 0% | 1 | | | |
| **Oxygen saturation** | | | | | | | | |
| a) 81-85% | 5 | 50% | 0 | 0% | 5 | $\chi2$=5.833 | df=2 | p=.054 Significant |
| b) 86-90% | 2 | 20% | 0 | 0% | 2 | | | |
| c) 91-95% | 1 | 10% | 2 | 20% | 3 | | | |
| d) 96-100% | 0 | 0% | 0 | 0% | 0 | | | |
| **GCS (Glasgow coma scale)** | | | | | | | | |
| a) Mild (13-15) | 1 | 10% | 0 | 0% | 1 | $\chi2$=1.518 | df=2 | p=.468 NS |
| b) Moderate (9-12) | 1 | 10% | 1 | 10% | 2 | | | |
| c) Severe (3-8) | 6 | 60% | 1 | 10% | 7 | | | |

**P< 0.05 significant**

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Chi square analysis was. It reveals that, a selected biological parameter such as age ($\chi2$=10.00, df=3, p=0.019), gender ($\chi2$=5.833, df=1, p=0.016), respiratory rate ($\chi2$=5.833, df=2, p=0.054) and oxygen saturation ($\chi2$=5.833, df=2, p=0.054) are the biological parameter who are significant to pain level score ofcritically ill ventilated patients with their selected biological parameter of endotracheal tube suctioning at P<0.05 level significance. Hence, the hypothesis $H_2$ was accepted.

**TABLE 5: Association between pain score of ventilated critically ill ventilated patients with their selected biological parameter of oral suctioning n=20**

| Biological Parameter | Pain score | | | | | | N | Chi square | Df | Level of significance |
|---|---|---|---|---|---|---|---|---|---|---|
| | No Pain | | Mild Pain | | Moderate pain | | | | | |
| | N | % | n | % | N | % | | | | |
| **Age** | | | | | | | | | | |
| e) 21-30 years | 1 | 10% | 2 | 20% | 2 | 20% | 5 | $\chi2$=3.433 | df=6 | p=.753 NS |
| f) 31-40 years | 0 | 0% | 1 | 10% | 1 | 10% | 2 | | | |
| g) 41-50 years | 1 | 10% | 1 | 10% | 0 | 0% | 2 | | | |
| h) > 50 years | 0 | 0% | 1 | 10% | 0 | 0% | 1 | | | |
| **Gender** | | | | | | | | | | |
| c) Male | 1 | 10% | 3 | 30% | 2 | 20% | 6 | $\chi2$=.139 | df=2 | p=.933 NS |
| d) Female | 1 | 10% | 2 | 20% | 1 | 10% | 4 | | | |
| **Diagnosis** | | | | | | | | | | |
| e) Pneumonia | 1 | 10% | 2 | 20% | 0 | 0% | 3 | $\chi2$=10.08 | df=4 | p=.039 Significant |
| f) COPD | 0 | 0% | 0 | 0% | 3 | 30% | 3 | | | |
| g) ARDS | 1 | 10% | 3 | 30% | 0 | 0% | 4 | | | |
| h) Tuberculosis | 0 | 0% | 0 | 0% | 0 | 0% | 0 | | | |
| **Heart rate** | | | | | | | | | | |
| e) 61-70 b/min | 0 | 0% | 0 | 0% | 0 | 0% | 0 | | | |

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| | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| f) 71-80 b/min | 0 | 0% | 0 | 0% | 0 | 0% | 0 | $\chi2=6.825$ | df=2 | p=.033 significant |
| g) 81-90 b/min | 2 | 20% | 0 | 0% | 1 | 10% | 3 | | | |
| h) >90 b/min | 0 | 0% | 5 | 50% | 2 | 20% | 7 | | | |
| **Respiratory rate** | | | | | | | | | | |
| e) 11-14 breath/ per minute | 0 | 0% | 1 | 10% | 0 | 0% | 1 | $\chi2=7.433$ | df=6 | p=.283 NS |
| f) 15-18 breath/ Per minute | 0 | 0% | 0 | 0% | 2 | 20% | 2 | | | |
| g) 19-22 breath/ Per minute | 1 | 10% | 3 | 30% | 1 | 10% | 5 | | | |
| h) 23-26 breath/ Per minute | 1 | 10% | 1 | 10% | 0 | 0% | 2 | | | |
| **Blood pressure** | | | | | | | | | | |
| e) Normal ( less than 120/80 mm of hg) | 0 | 0% | 1 | 10% | 1 | 10% | 2 | $\chi2=7.433$ | df=6 | p=.283 NS |
| f) Elevated ( elevated 130/90 mm of hg | 0 | 0% | 3 | 30% | 2 | 20% | 5 | | | |
| g) Stage 1 (140/90 mm of hg) | 1 | 10% | 1 | 10% | 0 | 0% | 2 | | | |
| h) Stage 2 (more than 150 mm of hg) | 1 | 10% | 0 | 0% | 0 | 0% | 1 | | | |
| **Oxygen saturation** | | | | | | | | | | |
| e) 81-85% | 0 | 0% | 1 | 10% | 1 | 10% | 2 | $\chi2=3.389$ | df=6 | p=.759 NS |
| f) 86-90% | 1 | 10% | 1 | 10% | 0 | 0% | 2 | | | |
| g) 91-95% | 1 | 10% | 1 | 10% | 1 | 10% | 3 | | | |
| h) 96-100% | 0 | 0% | 2 | 20% | 1 | 10% | 3 | | | |

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| **GCS (Glasgow coma scale)** | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| d) Mild (13-15) | 1 | 10% | 4 | 40% | 1 | 10% | 6 | $\chi2=1.806$ | df=2 | p=.405 NS |
| e) Moderate (9-12 | 1 | 10% | 1 | 10% | 2 | 20% | 4 | | | |
| f) Severe (3-8) | 0 | 0% | 0 | 0% | 0 | 0% | 0 | | | |

**< 0.05 significant**

Chi square analysis reveals that, a selected biological parameter such as heart rate ($\chi2=6.825$, df=2, p=0.033), diagnosis ($\chi2=10.08$, df=4, p=0.039), are the biological parameter who are significant to pain level score ofcritically ill ventilated patients with their selected biological parameter of oral suctioning at P<0.05 level significance. Hence, the hypothesis $H_2$ was expected,

**Discussion**

many critically ill adult patients experiences significant pain during hospitalization, In the intensive care unit same patient have pain during rest and some have pain during routine care, such as suctioning, Turing and wound care. Proper assessment is the first step in managing pain for those who are critically ill, pain assessment should have depend onlocation, characteristics, severity, onset, and duration.

**Conclusion**

This study concluded that majority six (60%) of the patient have moderate pain, whereas the two (20%) have severe pain and two (20%) were have mild pain during endotracheal tube suctioning, during oral suctioning the finding revealed that majority five (50%) of the patient experienced mild pain, whereas the three (30%) have moderate pain and were two (20%) have experienced no pain. From the present study, it shows that patients experienced more pain during endotracheal tube suctioning than oral suctioning. It is highly concerned that nurses should be watchful enough and should not neglect pain.

**Conflict of interest**

There was no conflict of interest.

**Source of finding**

The study is not funded by any external sources as it is self-funded research project.

 

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**Ethical clearance**

Ethical clearance has been obtained from Sumandeep vidyapeeth institutional ethical committee and willingness has been obtained from participants before data collection.

**References:**

1. Gallup survey conducted by the Gallup Organization from Supported by the Arthritis Foundation and Merck & Company, Inc.1999
2. Fox CD, Berger D, Fine PG, et al. Pain assessment and treatment in the managed care environment. A position statement from the American Pain Society. Glenview, IL: American Pain Society; 2000.iams & Wilkins; 2001.
3. Gélinas C, Fortier M, Viens C, Fillion L, Puntillo K. Pain assessment and Management in critically ill intubated patients: A retrospective study. Am J Crit Care. 2004.
4. Gordon DB, Dahl JD, Miskowski C, McCarbeg B, Toodd KH, Paice J, et al. American pain society recommendations for improving the quality of acute and cancer pain management. Arch Intern Med. 2005.
5. Joffe AM, Hallman M, Gélinas C, Herr DL, Puntillo K. Evaluation and treatment of pain in critically ill adults. SeminRespirCrit Care Med. 2013.
6. B mukhim, M sengupta comparative study on pain assessment of ventilated patient, manipaljournal of nursing 2017.
7. Shahnaz Mohammed Ayasrah.Pain among non-verbal critically Ill mechanically ventilated patients: Prevalence, correlates and predictors.Journal of Critical Care Volume 49, February 2019.
8. Rijkenberg S, Stilma W, Bosman RJ, van der Meer NJ, van der Voort PH. Pain measurement in mechanically ventilated patients after cardiac surgery: Comparison of the Behavioral Pain Scale (BPS) and the Critical-Care Pain Observation Tool (CPOT). Journal of cardiothoracic and vascular anaesthesia. 2017

 